



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/552,008	03/13/2007	Pratibhash Chattopadhyay	FER-15618.001.001	6289
7609 7590 08/21/2009 RANKIN, HILL, & CLARK LLP 23755 Lorain Road - Suite 200 North Olmsted, OH 44070-2224				
EXAMINER				
HUDA, SAIED M				
ART UNIT		PAPER NUMBER		
1791				
MAIL DATE		DELIVERY MODE		
08/21/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/552,008

Applicant(s)

CHATTOPADHYAY ET AL.

Examiner

SAEED M. HUDA

Art Unit

1791

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3-5, 7 and 10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-5, 7, and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/20/2009 has been entered.

Response to Amendment

2. The response filed on 06/29/2009 has been fully considered and entered into the record. Claims 1, 3-5, 7, and 10 are pending in this application.

Response to Arguments

3. Applicant's arguments filed 06/29/2009 have been fully considered but they are not persuasive.

Applicant provides an overview of Daitch et al. in view of Lee et al. and states that Lee teaches a process that is very similar to that taught by Daitch et al. Applicant goes on to state that The Examiner is mistaken in his interpretation that Lee teaches that which is missing from Daitch et al.; namely the use of supercritical fluid for the purpose of extracting a second material from the composite particle. Applicant is, however, mistaken on this point. Lee et al. has been brought in to teach that the composite is in the shape of particles (see previous rejection).

Applicant goes on to state that "The Examiner is apparently under the belief that the 'delicate pore and lattice structure' from which the solvent is extracted using a supercritical fluid in the process according to Lee et al. is a composite particle having dimension up to about 2 microns" and that this is incorrect.

Applicant cites paragraph [0037] to show that Lee et al. explains that in order to obtain particles, aerogel material must be milled. Applicant also cites paragraph [0021] to demonstrate this point. The Examiner, however, believes that paragraph [0021] shows that milling is not an essential process to the process of supercritical fluid extraction. Paragraph [0021] states that subsequent to fluid extraction "the resulting aerogels are then milled to the desired final particle size". This shows that the milling process is an additional process separate from the process of supercritical fluid extraction.

Applicant goes on to state that the amendment of claims 1 and 10 should be sufficient to overcome the rejection of claim 7. Applicant states that Chattopadhyay et al. teach the use of supercritical carbon dioxide to extract a solvent from an emulsion. Thus, Chattopadhyay et al. does not teach the use of supercritical fluid for the purpose of extracting a second solid material from a composite particle. The Examiner refers applicant to Chattopadhyay et al. (abstract) and to the previous rejection which discloses a method for continuously producing particles from an emulsion by supercritical fluid extraction (a method similar to that of Daitch et al. in view of Lee et al.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3-5, 7, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daitch et al. (US 6447991 B1) in view of Lee et al. (US 2002/0094318 A1) and further in view of Chattopadhyay et al. (US 2004/0156911 A1).

- a. With regards to claims 1 and 10, Daitch et al. disclose an aerogel material doped with special bioaffinity compounds to providing means of unique collection, detection and identification of bioaerosols, including bacteria, viruses, toxins, and other bioaerosols (abstract). Daitch et al. disclose a method of regular (non-doped) aerogel production is the sol-gel process where a solution of silicate monomer (sol) undergoes polymerization to a gel (composite that has a first material that is not soluble in a supercritical fluid and a second material that is soluble), as shown in FIG. 1. Specifically, an ethanol solution of tetraethoxysilane $\text{Si}(\text{OCH}_2\text{CH}_3)_4$ in the presence of water, ethanol, and catalyst, undergoes partial hydrolysis and a condensation reaction to form a sol (a colloidal dispersion of particles in liquid). As the process of polymerization continues, a solid silicate network separates out of the solution (gel point). The solid is still "soaking" in the ethanol solution; this biphasic system is usually referred to as the alcogel. Subsequent removal of the liquid phase (second

material) from the alcogel by supercritical drying (use of supercritical fluid), results in a low density, highly porous silica aerogel (column 3, lines 5-18).

Daitch et al. fail to teach that the composite is in the shape of particles or that the second material is a solid selected from the list found in the claim.

Lee et al. teach preparing highly porous, low density, micron sized aerogel particles ([0021]) and the use of a sol-gel process ([0028]) (similar to process and material used in Daitch et al.). Lee et al. also states that the particles would be in the size range of submicron up to about 2 microns ([0028]) (aerodynamic size range and geometric volume diameter). It would have been obvious to one having ordinary skill in the art at the time of the invention to use the process of Daitch et al. to form particles because this is an art recognized geometry as exemplified by the teaching of Lee et al. Daitch et al. in view of Lee et al. fail to teach that the second material is a solid selected from the list found in the claim.

Chattopadhyay et al. teach a method and apparatus for continuously producing particles from an emulsion by supercritical fluid extraction (abstract). Chattopadhyay et al. state that a carrier or matrix material (solid) can be dissolved in the emulsion phase that is soluble in the supercritical fluid. Preferred matrix material includes polymer, filler, lipid, and wax ([0053]). It would have been obvious to one having ordinary skill in the art at the time of the invention to use the above materials in the invention of Lee et al. Daitch et al. because these are art recognized materials used in an application similar to that of Lee et al. Daitch et al. as exemplified by the teaching of Chattopadhyay et al.

- b. With regards to claim 3, Daitch et al. teach that dopants are added at the alcogel stage and allowed to react with the surface silanols. This is followed by supercritical fluid extraction that will result in a surface modified "doped" aerogel with a high-bio affinity receptor drug (column 3, line 40-47) (i.e. the aerogel is a pharmaceutical in nature and becomes a biological agent).
- c. With regards to claim 4, Daitch et al. teach that a solid silicate network separates from the solution and that the solid is still "soaking" in the ethanol solution (fluidized bed) and subsequently removal of the liquid phase occurs by supercritical drying (column 3, lines 10-15). Daitch et al. in view of Lee et al. teach that this silicate network is actually a group of particles.
- d. With regards to claim 5, the particles obtained from the modified invention of Daitch et al. in view of Lee et al. are suspended in ethanol solution where there is no recognition that the solvent is soluble in supercritical fluid (column 3, lines 10-17).
- e. Regarding claim 7, Daitch et al. in view of Lee et al. teach that most commonly the supercritical fluid will be carbon dioxide (Lee et al. [0028]).

Conclusion

- 3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SAEED M. HUDA whose telephone number is (571) 270-5514. The examiner can normally be reached on 8:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KHANH NGUYEN/
Primary Examiner, Art Unit 1791

/SAEED M. HUDA/
Examiner, Art Unit 1791